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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,121

08/15/2007

Yi Xiong

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EXAMINER

PATEL, JAY P

ART UNIT

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2419

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/591,121	<b>Applicant(s)</b> XIONG ET AL.	
	<b>Examiner</b> JAY P. PATEL	<b>Art Unit</b> 2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 January 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The examiner failed to address claims 12-17 in the office action mailed on 10/29/2008. In fact, no indication of the status of the claims was presented. However, the examiner as stated below takes the position that the claims are not allowable. Since the claims weren't addressed in the office action mailed on 10/29/2008, the examiner must make the current office action a non-final office action.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1-4 and 11 are rejected under 35 U.S.C. 103(a) as being anticipated by Filsfils et al. (US Publication 20060193248 A1) further in view of Guichard et al. (US Publication 2006/0262735 A1).

In regards to claims 1 and 11, Filsfils teaches a memory 440 within provider edge device 400 (see figure 4). The memory 440 may include a separate label forwarding table for storing IGP label information (setting routing information of an outer tunnel) (see paragraph 54 on page 6). IGP label determines the packet's next hop within a routing domain (see paragraph 19 on page 2) and is the top label over a VPN label. Furthermore, the operating system may perform a label lookup operation in the label

forwarding table 500 based on the packet's VPN label (setting routing information of an inner tunnel) (see paragraph 54 on page 6).

In further regards to claims 1 and 11, figure 2 shows a PE3 (a double-ascription Provider Edge) which may route the packet (an initial node of the tunnels) and a PE2 (a terminal node of the tunnels) from where the packet exits network 110 and is received by CE2 (a remoter customer edge (CE)).

In further regards to claims 1 and 11, figure 5 illustrates the contents of forwarding table 500 from memory 440. The FRR enable flag 550, stores a value indicating whether FRR operation are currently being performed for data packet having VPN label values and destination IP addresses that match the contents of the table entry 510. When the operating system 460 detects a node or link failure over a PE-CE data link, the operating system sets the FRR enable flag values for those IP address prefixes 520 that were reachable over the failed PE-CE link (detecting tunnel states to obtain state information of the tunnels and updating the state information when it has changed) (see paragraph 56 on page 6).

In further regards to claims 1 and 11, the results of the table look up operation can be used to determine a particular PE-CE link over which the received packet should be forwarded next (the double-ascription PE of the remote CE obtaining available routing information according to the tunnel state information and the routing information of the at least two tunnels, and forwarding the service according to the available routing information) (see paragraph 54 on page 6).

In further regards to claims 1 and 11, although Filsfils teaches separate forwarding tables for IGP label (outer tunnel) and VPN label (inner tunnel). Filsfils fails to particularly teach, obtaining routing information from the routing information of both tunnels and routing according to the routing information of the tunnel corresponding to the available routing information.

Guichard however teaches the above-mentioned limitation in figures 9 and 10A-B. Guichard teaches a label-stack 920 inclusive of IGP label 922 and VPN label 930. At step 1050, an area border router performs an edge-device label lookup operation and identifies a two-level MPL label stack 920 inclusive of IGP label and VPN label (routing information of both tunnels). At step 1060, the packet is forwarded to provider edge 2 (PE2) (forwarding the packet based on the IGP label) and PE2 at step 1065 receives the packet at step 1065. PE2 performs a VPN label-lookup operation in a label forwarding table at step 1070 and at step 1075, the packet is forwarded a CE (forwarding the packet based on the VPN label) (see paragraph 69 on page 8).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate the two label look-up method to forward a packet as taught by Guichard into the teachings of Filsfils. The motivation to do so would be to use edge device labels in order to forward packets more efficiently.

In regards to claim 2, the memory 440 in Filsfils may include a separate label forwarding table for storing IGP label information (see paragraph 54 on page 6). IGP label determines the packet's next hop within a routing domain (see paragraph 19 on page 2) and is the top label (therefore, the presence of an outer tunnel defining an LSP is

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inherent) (also see paragraphs 25 and 26 on page 3) over a VPN label (see paragraph 31 on page 4). Furthermore, the operating system may perform a label lookup operation in the label forwarding table 500 based on the packet's VPN label (inner tunnel) (see paragraph 54 on page 6).

In regards to claim 3, the table 500 (from Filsfils) in addition to a VPN label column 530, also contains a back up PE device column 570 and backup label stack column 580 (sub optimal routing information). The IGP label value may be determined based on the contents of a separate label forwarding table configured (pre-configured matching strategies) to store IGP label information used to forward data packets within the provided network 110 (see paragraph 58 on page 7).

In regards to claim 4, the FRR enable flag 550 (in Filsfils), stores a value indicating whether FRR operation are currently being performed for data packet having VPN label values and destination IP addresses that match the contents of the table entry 510. When the operating system 460 detects a node or link failure over a PE-CE data link, the operating system sets the FRR enable flag values for those IP address prefixes 520 that were reachable over the failed PE-CE link (see paragraph 56 on page 6).

3. Claims 5-10 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Filsfils et al. (US Publication 20060193248 A1) further in view of Guichard et al. (US Publication 2006/0262735 A1) further in view of Gouge et al. (US Patent 7343423 B2).

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4. In regards to claim 5, Filsfils in combination with Guichard teaches all the limitations of parent claims 1 and 2. Filsfils and Guichard fail to teach, advertising the availability/unavailability of the tunnel through a tunnel fast convergence technique. Gouge however teaches the above-mentioned limitation. Gouge teaches a routing processor 202 which notifies all line cards 108 of a link failure in an LSP when one line card 108 detects a failure (see column 6, lines 56-67).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate the failure notification taught by Gouge into the FRR enable flag setting taught by Filsfils. The motivation to do so would be to protect all LSPs which use a failed link because all LSPs that use a failed link will also fail.

5. In regards to claims 6-7, Filsfils in combination with Guichard and Gouge teaches all the limitations of parent claims 1-2 and 5. Filsfils and Guichard fail to teach updating the tunnel state information in a forwarding table or a storage unit.

Gouge however teaches the above-mentioned limitation in step 404 where each line card 108 sets its global fix-up flag if it not already set to indicate that there is now an active rewrite process for adjacency information in forwarding table 302 (see column 6, lines 66-67 and column 7, lines 1-2).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate the failure notification taught by Gouge into the FRR enable flag setting taught by Filsfils. The motivation to do so would be to

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protect all LSPs which use a failed link because all LSPs that use a failed link will also fail.

6. In regards to claim 8, Filsfils illustrates the operation in figure 7. At step 720, if the FRR is not enabled (obtaining the state of the primary tunnel and judging that the primary tunnel available), the packet is forwarded using the received VPN label value (forwarding the service to the remote CE through the primary tunnel).

If at step 720, if the FRR is enabling (primary tunnel is not available), after subsequent steps, the packet is forwarded through a backup PE device at step 755.

7. In regards to claim 9, Filsfils in combination with Guichard and Gouge teaches all the limitations of parent claims 1-2 and 5-7. Filsfils and Guichard fail to teach, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available. Gouge teaches the above-mentioned limitation at step 512 where a determination is made to see if the backup tunnel active table entry is set.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate the failure notification taught by Gouge into the FRR enable flag setting taught by Filsfils and the teachings of Guichard. The motivation to do so would be to protect all LSPs which use a failed link because all LSPs that use a failed link will also fail.

8. In regards to claim 10, Filsfils illustrates the operation in figure 7. At step 720, if the FRR is not enabled (obtaining the state of the primary tunnel and judging that the primary tunnel available), the packet is forwarded using the received VPN label value (forwarding the service to the remote CE through the primary tunnel).



If at step 720, if the FRR is enabling (primary tunnel is not available), after subsequent steps, the packet is forwarded through a backup PE device at step 755.

In regards to claims 12 and 13, at step 720 if FRR is not enabled (primary tunnel is available and judging and obtaining the state of the tunnel), the packet is forwarded based on the received VPN label (primary tunnel). If at step 720, if the FRR is enabling (primary tunnel is not available), after subsequent steps, the packet is forwarded through a backup PE device (forwarding the service to the remote CE through the backup tunnel) at step 755.

9. In regards to claims 14 and 15 a check is made at step 735, the backup PE device is associated with a prefix and there is no service label at step 740 (back up tunnel is available due no protection on the packet) the packet is forwarded through the backup PE device.

10. In regards to claims 16 and 17, the Filfils, Guichard and Gouge fail to particularly teach load sharing tunnels.

Filfils however shows the procedure to send packets through a backup tunnel in figure 7 when the primary tunnel is unavailable. The use of load sharing tunnels is well known standard for implementing back up tunnels. Furthermore, it is well known in the art that applying a well known standard, or protocol, to a system provides the system with significantly improved industrial applicability. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the load sharing tunnel to the system of Filfils, since it is well known in the art that applying a well known standard, or protocol, to a system provides the system with significantly improved industrial applicability.

### ***Response to Arguments***

Applicant's arguments filed 1/26/2009 have been fully considered but they are not persuasive. The applicant argues that the primary and back up LSPs (label switch paths) are not equivalent to tunnels. However, an LSP is also referred to as an MPLS Tunnel.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAY P. PATEL whose telephone number is (571)272-3086. The examiner can normally be reached on Mon.-Thurs.: 8:00 a.m.- 6:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel J. Ryman can be reached on (571)272-3152. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/J. P. P./  
Examiner, Art Unit 2419

/Daniel J. Ryman/  
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